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SEPTEMBER 10, 1949

SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



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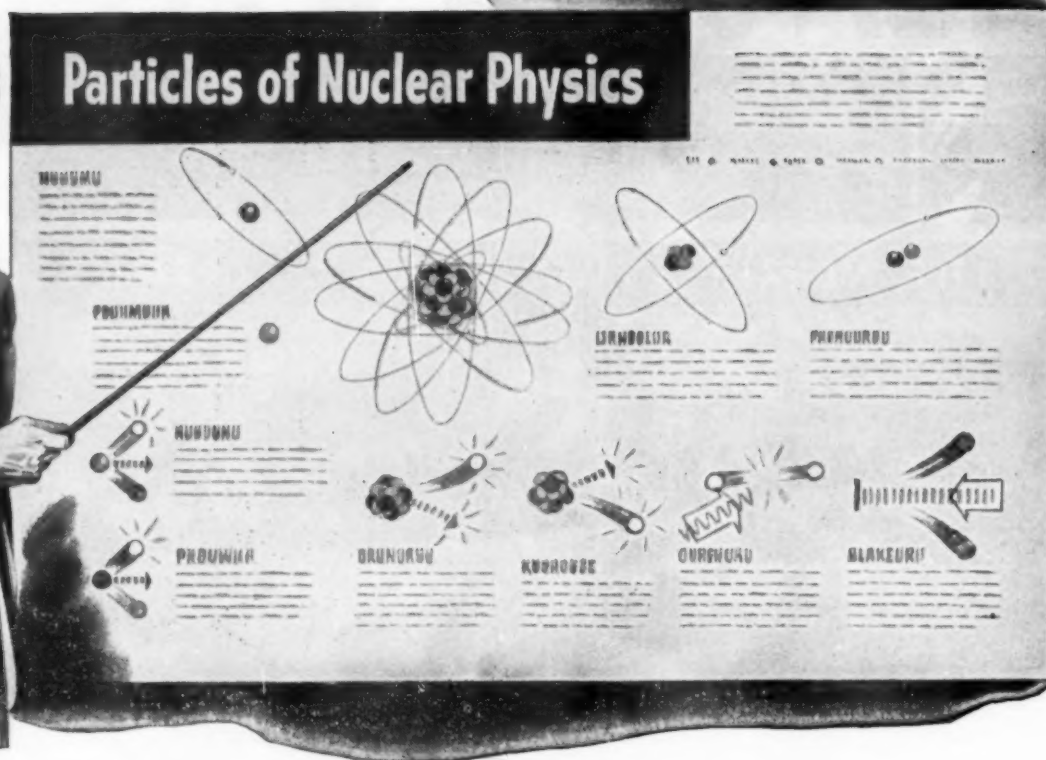
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PHYSICS-CHEMISTRY

New Super Microscope

A British scientist has constructed a reflecting microscope which "sees" the living chemistry of cells with mirrors and the invisible light of infra-red rays.

► A SUPER microscope that "sees" the chemistry of living things, hailed as a "revolutionary" advance with applications so vast they may not be "fully explored in our lifetime," was reported to the British Association for the Advancement of Science, meeting in Newcastle, England.

This super microscope, called the reflecting microscope because it "sees" with mirrors instead of lenses, was constructed by Dr. C. R. Burch of Bristol, England. Research with it in fields ranging from cancer-fighting to manufacture of synthetic fabrics like nylon was reported by Dr. Robert Barer of Oxford University.

Exciting feature of the new microscope to scientists is that with it they can use the invisible light of infra-red rays for spectral analysis and identification of chemicals. The infra-red absorption spectrum of a chemical compound is so characteristic that chemists often call it the "fingerprint of the molecule."

With the new reflecting microscope they can now detect the presence of a chemical, such as penicillin or a vitamin or a cancer-causer, inside a living cell by its spectral "fingerprint." In addition they can find what part of the cell it is in, and how it may be changed structurally by other chemicals in the cell.

Fibers of muscles and nerves and also of fabrics, such as terylene, the English nylon-like material, are being studied with this new microscope. Changes are being detected in the fiber chemicals, according to whether the fiber is stretched or unstretched.

The structures of a minute crystal of a mold chemical related to penicillin and of a crystal of the anti-pernicious anemia vitamin B₁₂ are showing themselves through spectral analysis of their mirror-magnified images.

Instead of lenses, such as ordinary refracting microscopes have, the reflecting microscope made by Dr. Burch is equipped with a small spherical convex mirror and a large aspherical concave mirror to do the magnifying job. The mirrors are made of speculum metal coated with a very thin reflecting layer of aluminum. Reflecting microscopes have been made in several countries but some of them are equipped with lenses as well as mirrors and some do not have aspherical mirrors.

The clearance between the object to be viewed and the small mirror of the Burch microscope is about an inch and a half, or some 13 times the working distance on a lens microscope with a similar numerical aperture. This makes for much easier

manipulation and permits examination and dissection under high magnification of organs such as the liver, spleen, kidney and brain of a living anesthetized animal.

Microscopes, however, are no longer regarded as merely super magnifying glasses, Dr. Barer pointed out.

"Indeed, with the reflecting microscope we may not always want to look at the ordinary appearance of the object at all," he declared.

"It is quite possible that in future work with this instrument we may be content to learn about the chemistry of the object by observing the behavior of a spot of light on a cathode-ray tube screen. This is indeed a far cry from the careful visual observation of preserved and stained specimens on which so much knowledge of cell structure is based."

No reflecting microscopes have yet been

built in the United States, so far as is known. Scientists at the National Bureau of Standards, however, are enthusiastic about the possibilities of "seeing" new things with this type microscope and foresee a "rush of energetic research workers" into the field.

Science News Letter, September 10, 1949

AGRICULTURE

Cucumber Grafts on Squash Grow Faster, Double Yield

► CUCUMBER vines grafted on squash vines grew much faster than did cucumber vines growing on their own roots. The yield of cucumbers from grafted vines was doubled.

These results of a number of field experiments are announced by Drs. Dontcho Kostoff and Manol Stoyloff, of the Bulgarian Academy of Sciences.

Primary objective of the experiments was to find a way to grow cucumbers without irrigation. The squash vines, with their stouter growth and deeper-thrusting roots, were able to tap moisture levels in the soil which the weaker roots of cucumber vines could not reach.

Science News Letter, September 10, 1949



WILD BLACK EYED SUSAN CULTIVATED—The yellow daisy held by Dr. Albert F. Blakeslee, director of the Genetic Experiment Station at Smith College, measures seven inches across. Research assistant, Mary Alton of Burlington, Ontario, holds in her left hand one of the wild field flowers for comparison. In her right hand is the double daisy, a globe of yellow petals, developed from the same wild flower. These specimens were developed by treating the yellow daisy with colchicine which doubles the chromosomes and tends to enlarge the flower's size and deepen its color. Selection and cross-breeding have resulted in several new garden varieties.

AERONAUTICS

Refueling in Mid-Air

► REFUELING long-range planes in mid-air may become a relatively common practice, it was predicted recently by Sir Alan J. Cobham of England, managing director of Flight Refuelling, Ltd.

Advantages include elimination of the necessity of making stops between terminals to take on gasoline, decreasing the time required for long flights, and the ability to carry heavier payloads due to the saving in weight from lesser loads of fuel.

Refueling in mid-air is not a new procedure. American stunt flyers during the past two decades have remained in the air for weeks at a time by mid-air refueling. The equipment used, however, was somewhat crude. The British company represented by Sir Alan has approached the problem from a scientific viewpoint, and during the past 15 years has succeeded in developing equipment that makes mid-air refueling more practical.

It was this British company that supplied the equipment for refueling the U. S. Air Force bombers that took part in the recent round-the-world-non-stop flight, and also the more recent achievement of an English jet-fighter which remained in the air for 12 hours.

Flight-refueling systems are safe, simple, reliable and inexpensive, according to Sir Alan. The equipment on the plane to be refueled consists of fuel lines built into the airframe and usually leading to a single intake. Automatic valves at each tank permit the selective filling of individual tanks or any number of tanks.

The pilot of an airliner equipped for mid-air refueling merely flies on a straight and steady course, the aviation scientist explained. The flight engineer presses a button which lets out a "drogue" or specially equipped fuel line from the tail of the plane. A tanker approaches from the

rear and, with an automatic probe, makes the fueling connection. The tanks are filled automatically and the engineer presses another button which retracts the drogue.

Fuel is transferred under pressure at rates up to 300 gallons a minute, but, due to the closed system, no leakage occurs at any time during the operation. The British system is now available to Flight Refueling, Inc., Danbury, Conn.

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On This Week's Cover

► THE crafty crab spider captures its prey in its long, powerful front legs, concealing itself in flowers and leaves and lying in wait for its victims.

This spider has the ability to change its color so that it will blend with the color of its surroundings. Generally its color ranges from white to yellow, and it has a few darker markings on its body to help camouflage it.

It's called a crab spider because it runs sideways like a crab when it is disturbed. When it is pulled from its hiding place, it will hang on by spinning a fine line of beautiful silk that glistens in the sunlight.

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GENERAL SCIENCE

Elect FIDO Developer Head Of British Science Group

► A SCIENTIST who helped develop the fog-fighting system that saved the lives of countless American fliers during World War II has just been elected to one of the highest positions in British science.

The new president of the British Association for the Advancement of Science, Brig. Gen. Sir Harold Hartley, served as a scientific adviser to the Petroleum Warfare Department and was concerned with the development of FIDO (fog, intensive dispersal of), which used controlled fires to clear the fog over landing fields. This system was used on American and British airports in England during the war to clear landing fields for returning fliers. It is now experimentally in use at some American airports.

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SCIENCE NEWS LETTER

VOL 56 SEPTEMBER, 10, 1949 No. 11

48,600 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C., NO:th 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change, please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STATE 4439.

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POPULATION

Population Needs Curbing

If Eastern countries would restrain their high birth rate to the pace set by the Western world, there would be no danger of starving for the world.

➤ THE world will not starve due to inadequate food production if population increases as it does in Western countries, Sir John Russell, leading agricultural expert and director of famed Rothamsted experimental station, told the British Association for the Advancement of Science at Newcastle, England, in his presidential address.

But the world's food can easily be outstripped locally if the high birth rates of Eastern countries prevail, he warned. If standards of living such as in the United States, Europe and other western areas are desired, the rest of the world must adopt population restraints, such as birth control, he intimated.

Great increases in food production have resulted from the application of science to agriculture, Sir John told his fellow scientists. Whereas a food producer can feed four to five people under the old system of agriculture, modern methods can feed about 15 to 20 persons per farmer, provided the industrial civilization gives him the mechanized tools with which the up-to-date farmer can work.

There are on the average only about one and one-half acres of land per person in the world used to produce food, whereas there exist about five acres per head that might be used so far as climate is concerned. One great problem is to bring the unused three and one-half acres under cultivation.

"The limit to the world's food production at any time is set by the efficiency of the plant as a transformer of radiant energy," he said. "At present this does not exceed 5% and, reckoned on the basis of the amount of food produced, it is much less. Whether this can ever be raised, whether we can ever do more than increase the proportion of assimilation products useful as food, cannot be said. But the present limitations to food production: utilization of 7% to 10% only of the earth's surface; conversion by the animal of 10% to 25% only of its food into human food; and fixation by the plant of no more than 5% of the radiant energy it receives. These are all challenges to agricultural science—which its workers are vigorously taking up."

Sir John warned that food will not be produced in the world merely as a sense of duty.

"If more food is needed, more work must be done," he said. "Food producers will labor to obtain a surplus for the outside world only on a condition that they are provided with adequate appliances and

incentives. The replacement of craftsmanship by mechanization is inducing in agriculture, as in industry, a flight from labor. In many cases now the problem is not so much to increase output as to maintain markets and reduce hours of work. Happily, in spite of modern tendencies, a strong sense of individual responsibility in regard to hungry peoples still survives among food producers."

Great as are the powers of science, he warned, they are of only limited help in the case of human problems, such as population control. "Science can do much to overcome material difficulties and, better still, to satisfy man's thirst for knowledge of the universe in which he lives," he said. "It can insist continuously on our high duty to seek out the truth fearlessly and honestly, and having found what we believe to be the truth, to proclaim it—but in all humility, and recognizing that we may be wrong. Apart from that, science can give little guidance in those great moral and spiritual problems which lie at the root of our most serious troubles today. It opens up many possible ways of life

but gives no help in choosing which to follow; it deals with the facts of existence but not with the values of existence. It gives some light to them that sit in darkness, but it has little consolation for those in the shadow of death and it does not guide our feet into the way of peace.

"Even if science should make large scale fighting wars impossible it can do little against the more subtle wars by infiltration. It offers us great possessions but as the old aristocracy knew, great possessions imply great personal responsibilities. Democracies still have this to learn."

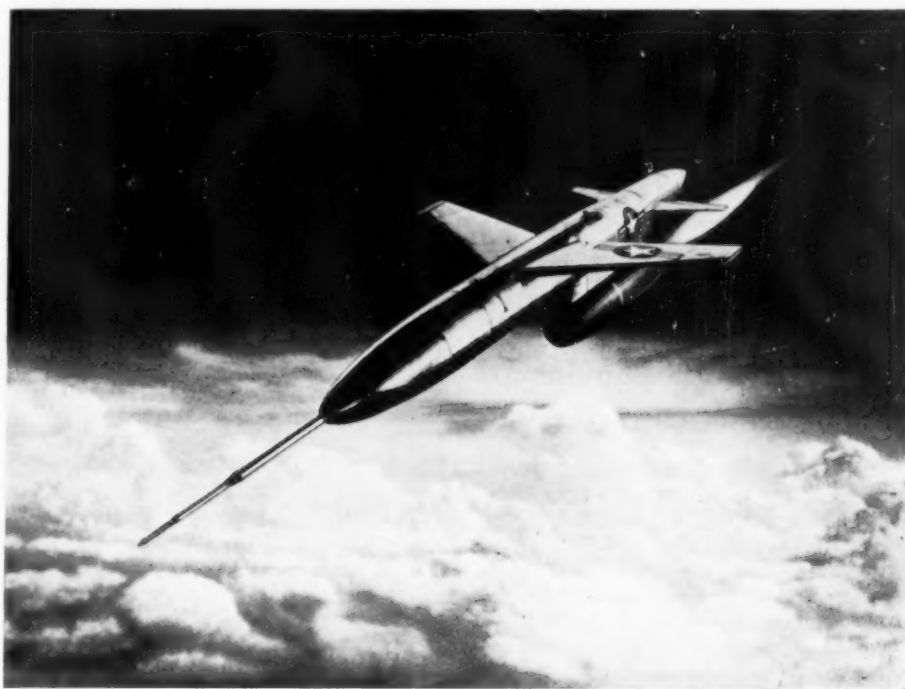
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AERONAUTICS

Navy Gunners' Skill Against Fast Target to be Tested

➤ THE effectiveness of Navy anti-aircraft gunners in bringing to earth pilotless, radio-controlled targets, traveling at speeds well up to that of sound, is to be tested soon. The speedy target will be the Navy's plane-like, ram-jet powered KDM-1, built by the Glenn L. Martin Company of Baltimore.

This Martin KDM-1 ultra-high-speed target drone resembles the ordinary jet-propeller fighter with a lance-like projection from its nose, but is smaller. It has swept-back wings and a horizontal tailpiece. Its engine, however, is to the rear and under the bomb-shaped body. It is the ram-jet type, unable to operate until its carrier has a speed of some 300 miles an hour and the engine can gather in enough air to cause



SPEEDY TARGET DRONES—These will be used by the Navy to simulate maneuvers of the fastest fighter planes in order to sharpen the eyes of the anti-aircraft gunners of the surface fleet.

proper combustion.

To get the drone into the air and give it sufficient speed to permit the engine to operate, another plane is used. At proper speed and altitude, the KDM-1 is fired and released. From that point on, the target is on its own except for the radio-controls, operated at will from the earth below.

Upon exhaustion of its fuel, the KDM-1 noses up sharply, a parachute is released and the target drops gently into the water over which it has been flying. Experience shows that any damage that may occur is only slight, and the target drone can be readily made available for another flight.

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MINERALOGY

Air Is Mined for Millions In Precious Metals

► THE air is being mined for a million dollars and more worth of gold, silver and other metals.

A Los Angeles chemist, Walter A. Schmidt, told how it's done at the United Nations Scientific Conference on the Conservation and Utilization of Resources at Lake Success, N. Y.

Valuable quantities of minerals, precious and otherwise, are released into the air as industrial wastes, Mr. Schmidt explained. Smoke from improvident factories may be worth a fortune, he stated.

Industrial plants which have taken measures to recover these minerals have been well repaid.

Here are some of the findings reported by the chemist:

"One smelter recovers more than \$1,000,000 a year in gold, silver and copper out of the gases from 12 multiple-hearth roasters.

"One mint recovers more than \$100 a year in gold and silver from the gases ventilating its refining furnaces.

"One lead smelter recovers more than \$300 a year in lead and silver out of the gases from 10 sintering machines."

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GENERAL SCIENCE

English Is Most Popular Scientific Language

► ENGLISH is now the most widely used language for scientific articles, pushing German and French into the background.

More than half, 57%, of all scientific articles are now published in English, Fletcher S. Boig, professor of chemistry at Northeastern University, Boston, Mass., found in a survey of scientific periodicals and articles.

Russian, which was of slight importance as a scientific language 20 years ago, now follows French and German as an important language of science.

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U. N. SCIENTIFIC CONFERENCE—Carter Goodrich (center), professor of economics at Columbia University, New York, and programme director of UNSCCUR, discusses programme with, left to right: Antoine Goldet, director of the U. N. Department of Economic Affairs; S. S. Bhatnagar, secretary to the Government of India, Department of Scientific Research; Fairfield Osborn, president of New York Zoological Society; and Colin G. Clark, director of the Australian Bureau of Industry.

CHEMISTRY

Fertilizer from Dead Sea

► THE Book of Moses and modern technology have joined forces to extract "inexhaustible" quantities of fertility from the Dead Sea, resource experts were told at Lake Success, N. Y.

An Israeli potash company is using aerial photography and solar energy to realize potentialities hinted at in the parable of Lot's wife. The curiosity that proved so fatal to that ancient lady is being coupled with the chemical ingenuity of Israeli's chemists to produce large quantities of three other elements in addition to pillars of table salt.

The most important of these is potash which is used as a fertilizer. According to Dr. M. R. Bloch of the Palestine Potash Company "the Dead Sea contains some 2,000,000,000 tons of potash and is a practically inexhaustible source of salt, magnesium, and bromine."

The biblical link was made by Dr. Bloch at a mineral section meeting of the United Nations Scientific Conference on the Conservation and Utilization of Resources. "I believe that chapters 14 to 21 of the first book of Moses should be reread in the light of modern experience," he said. "It is possible that the passage describes happenings in the vicinity of an important salt-supply

center for a Babylonian empire."

This biblical area has been carefully mapped from the air. The survey showed two natural formations where the Dead Sea brine is evaporated as if in a huge shallow dishpan. Using specially constructed pans to "harvest" the minerals left after the heat of the sun has evaporated the water content, the chemists then refine out the potash, salt, and the other components. By these techniques, vast quantities of fertilizer and valued minerals will be extracted from the Dead Sea. Vast enough, Dr. Bloch thinks, "to sustain a considerable advance in the standard of life in the world."

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Much of the *horsehair* used in stuffing furniture comes from the manes and tails of wild horses in Argentina; after the hair gets to America it is curled by a laborious hand process.

Much *commercial fish* is now filleted and skinned by machinery, reducing the labor involved in fish processing; all parts of the fish not reaching the human market find their way into animal feed or fertilizer.

PSYCHOLOGY

Rituals Help Hold Family

The ceremonies which become a part of family life increase its happiness. They are most common among better-to-do families.

►FAMILY rituals—those little acts that the whole family get together and take part in every day, every week or once a year—are important in holding the family together and increasing its happiness. This is the conclusion of Drs. James H. S. Bossard and Eleanor S. Boll, of the William T. Carter Foundation, University of Pennsylvania, from a study of some 400 cases.

Not every family has its own private ceremonies, they found, but those that do sometimes observe them very faithfully and they are of a great variety.

In one family there is a reading of the poem, "The Night Before Christmas," every year on Christmas Eve. The ceremony has become more and more elaborate with the passing years. Lights are extinguished and candles lighted. Refreshments are served. No one of the family would ever miss the occasion.

In another family, a ritual is made of the washing of hair on Thursday evening.

One father makes a ceremony of taking

home a package of gifts of candy, fruit, and so on to the family each Saturday.

Some make a ritual of listening to certain programs on the radio each week.

One interesting ritual is reported thus:

"I was in my last year in High School when the depression came. Our family was hit by it. I succeeded in getting a summer job to help out. The first Saturday I worked, Daddy and I came home at about the same time (10 o'clock) in the evening. I remember that I fried some eggs and made some coffee for us that night. While we ate, we talked about our experiences at work, then we put our weekly wages on the table and, with mother coming in, we planned our expenditures for the week ahead. Thus began a practice which has continued at our house ever since. Every Saturday night, we meet in the kitchen of our home at 10 o'clock. Eggs are fried, and coffee or cocoa is served. Then we talk—about our work, experiences of the past week, the family income, our plan

for family expenditures, and other matters of family importance. Often these family sessions last until after one o'clock. Six years ago, I was married, but my husband and I have kept our weekly date with mother and dad. None of us ever let anything interfere with these Saturday night get-togethers. They surely have become a ritual in the life of our families."

The study included 156 families from lower, middle, and upper class, selected from among patrons of a social settlement, a public school in a middle-class suburban district and the Junior League and Social Register.

Family rituals increase in number, variety, richness and willing cooperation by individual family members as one moves upward in the social scale, it was found.

"The lower class is one in which there is little connection with the past," the investigators observed. "The present is composed of individuals crowded into a space too small for comfort. The religion is predominantly Catholic. The economic situation is not one of affluence. Children see little of anything in their families to stimulate a desire to perpetuate what they see. Opportunities for emotional satisfactions in the home are few, even for the adults. The rituals arising from these situations are, for the most part, rituals of expediency, to keep the home going, and to facilitate escape from home into a more exciting or promising outside world."

The middle class is more comfortably situated. There is enough physical space to permit of frequent family get-togethers.

The upper class is guarding a way of life which is considered by them, and many others, to be the desirable way of life. They have the time, for the most part the wealth, and the physical surroundings in which they can perpetuate it. Rituals in this upper class group are more formalized and are more easily handed on from one generation to the next than in the other classes.

A complicating factor is the fact that large families, it was observed, tend to encourage rituals more than small families. And large families are found near the bottom of the economic scale, where the scale of living tends to hamper the tendency.

The study is reported in the AMERICAN SOCIOLOGICAL REVIEW.

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PSYCHOLOGY

Those Who Learn Fast Can Remember More

►THOSE who learn faster also remember more, Dr. George H. Zimny, of Loyola University, reported to the American Psychological Association in Denver, Colo., as a result of tests of speed of learning and amount retained conducted on 56 students.

The material learned was 15 meaningful but logically unconnected four-letter nouns.

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FISHERIES EXPERTS IN INFORMAL DISCUSSION—This group of experts on fisheries got together between meetings of UNSCCUR. They are, left to right: Lionel A. Walford, U. S., chief, Branch of Fishery Biology, Fish & Wildlife Service; Andrew Lyle Pritchard, Canada, director of Fish Culture Development, Department of Fisheries; Michael Graham, United Kingdom, director of Fishery Research, Ministry of Agriculture and Fisheries; M. Goldschmidt, U. N. Secretariat; Sunder Lal Hora, India, director of Zoological Survey; Ahmad Nazir, of Pakistan, and C. J. Botteman of The Netherlands.

GENERAL SCIENCE

Very Few Pennies Saved by Buying Paper Bound Books

► **BUYING** a book without the heavy cover would only save you a few cents, a publishing official states.

F. Ronald Mansbridge of the American branch of the Cambridge University Press says that there would be little saving to you if you could buy regular editions of books with only paper covers. Mr. Mansbridge's views are given in the journal, *SCIENCE* (Aug. 5), in answer to an American scientist's complaint about the high cost of scientific books.

* John R. Lowry of General Foods Corporation, Hoboken, N. J., wrote to the journal suggesting that paper-covered books might help cut the cost (See *SNL*, Sept. 3 p. 153).

"The saving in most instances would amount to only a few cents," declares Mr. Mansbridge. This, he explains, is because most of the job of binding a book has to be done regardless of the type of cover.

As for the price of books, Mr. Mansbridge has some further comments. Book prices are up, but they haven't doubled, and the cost of manufacturing books has in recent years.

"I believe that books show a smaller increase in price over the prices of ten years ago than almost any other commodity on the market," he concluded.

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ASTRONOMY

Fourth New Comet of 1949 Has Been Spotted

► **A NEW** comet, fourth of the year and second one to the credit of South African astronomer E. L. Johnson, was discovered Aug. 24.

Far too faint to be seen by the naked eye and too far south in the sky for many American telescopes, the new comet was spotted by Mr. Johnson from the Union Observatory at Johannesburg. First new comet of 1949 was also discovered by Mr. Johnson in May.

Of fourteenth magnitude, the comet was first spotted in the southern constellation of Capricornus, the horned goat. It was moving south and west in the sky and is now believed to be in the constellation of Microscopium, the microscope.

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GEOLOGY

Mexico's New "Volcano" Has Several Possibilities

► **THE** shepherd who was treated in Mexico for burns said to have come from a new volcano rising out of the earth southeast of Mexico City may have been the discoverer of volcanic Mexico's newest

erupting mountain. But there are several possibilities.

One is that he was too familiar with the story of Dionisio Pulido, a Mexican farmer whose corn field sprouted the now-famed Paricutin volcano only six years ago.

Only about two years ago, reports came of another "Paricutin," this one in Vera Cruz state. The "volcano" was a fumarole, a hole from which gases or fumes issue. And the reports, which momentarily excited earth scientists, were merely designed to get publicity and attract tourists.

But Mexico will, scientist believe, have other "corn field volcanoes" rising out of the earth as dramatically as Paricutin. One authority, Dr. Fred M. Bullard of the University of Texas, has traced the development of Mexico's volcanoes and says there will be more. But his theory puts the appearance of the next one along about two centuries from now.

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AGRICULTURE

Irrigation by Sprinkler System Best on Sandy Land

► **THE** sprinkler system for irrigating farm crops and orchards is often preferable to the ordinary ditch irrigation where it is necessary to save water, particularly on sandy or steeply sloping lands in cultivated crops.

This is one conclusion in a report of the U. S. Bureau of Reclamation on sprinkler irrigation. Copies may be obtained from the U. S. Government Printing Office. It is a comprehensive report, covering present sprinkler systems in use, particularly in the Northwest and in Texas.

The sprinkler system applies water from overhead from perforated pipes, or from rotary sprinklers much like those long used on lawns. Its application to commercial crops has been rapidly increasing during the past decade or so. Its advantage is that the water is applied evenly over the entire surface, gradually sinking into the soil to the depths required to be available to plant roots.

In ordinary commercial irrigation, water is distributed to the fields where needed by open ditches, and then permitted to flow between crop rows usually at right angles to the ditch. Soils near the ditch absorb an oversupply of water, while soil farther away may get too little. Much water also is lost by sinking deep in the soil where it is of little immediate value to ordinary crops.

The sprinkler system brings into irrigated crop production land where the ditch system can not be used because of terrain. Also no land is utilized for ditches, being therefore available for crops. The report points out economic problems that must be taken into consideration in determining which system to use. On land where either could be used, cost is the principal factor.

Science News Letter, September 10, 1949

IN SCIENCE

GENERAL SCIENCE

Plan Science Organization For Marshall-Aided Areas

► **BEGINNING** steps have been taken toward a scientific research organization for backing up the economic cooperation of Western European countries.

Technological investigations upon developments in coal, peat, tide power, wind power, and other large and wide-spread industrial applications of science are planned.

Organized under the chairmanship of Dr. Alexander King of the British government science office in London, the technical cooperation working party is a part of the OEEC, the organization for European economic cooperation of the Western European countries aided by the Marshall Plan.

The first actual international investigation is already underway in Holland, where a blast furnace is being devoted to a study of the luminosity of flames in the furnace in which oxygen-enriched blast is being used. British, Swedish and French engineers are working with Dutch specialists and facilities in this case.

Making liquid fuel out of coal and gas out of peat are high on the list of projects planned for inquiry.

Science News Letter, September 10, 1949

ASTRONOMY

Second Largest Telescope Ahead of Schedule

► **THE** second largest telescope in the world, being built at the University of California's Lick Observatory at Mount Hamilton, Calif., will go into operation two years ahead of schedule. Purchase of a 120-inch mirror cast in 1933 to test the design for the giant 200-inch Palomar telescope makes this possible.

Lick's new 120-inch mirror is now in a warehouse in San Jose near there, after a 400-mile truck trip from Pasadena. It will remain in the warehouse until the dome at Lick Observatory is completed. The 120-inch mirror was purchased from the California Institute of Technology, but has never been used because of a change in test procedure there.

The original design for the Lick telescope called for the conventional solid disk mirror. Recent tests at Palomar, proving beyond doubt the practicality of the new 200-inch design, led University of California astronomers to purchase the 120-inch test mirror of the same design.

Science News Letter, September 10, 1949

SCIENCE FIELDS

AERONAUTICS

Freezing Process Aids Removal of Plane Blades

► **THEY** are freezing them off in England: that is, they are removing airplane propeller wood blades from their steel hubs by a low temperature process.

These laminated wood blades are screwed into what is called a steel ferrule, by which they are fastened to the propeller boss in the engine shaft, and are tightly fastened with a special cement. Because great force is required to break the cement in trying to unscrew the blades, an easier process was desired.

Frigidaire engineers in Portsmouth, England, are responsible for the new process, according to Frigidaire Division of General Motors, Dayton, Ohio. Their suggestions were made to the Air Screw Company, of Weybridge, which has many occasions to remove wood blades from their ferrules. The new process is based on the fact that wood contracts about three times as much as steel when temperatures are reduced.

A special cooling cabinet is used. Its well-insulated chamber will hold eight propellers at a time. Low temperature is provided by a one horse-power air-cooled compressor. Between six and eight hours are required for the majority of blades to shrink sufficiently to allow them to be easily removed from their hubs.

Science News Letter, September 10, 1949

ANIMAL HUSBANDRY

Pluck Molting Rabbits For Best Wool Is Advice

► **HERE** is a tip for those who raise rabbits for wool: most top-grade wool is obtained from an Angora rabbit by plucking the animal when it is molting.

There is no significant difference between the total amounts of wool obtained during a year by plucking, clipping or shearing, irrespective of whether it is harvested every 10 weeks or at the time of molt. But in the production of top-quality wool, the method and time of harvest do make a difference, experiments conducted by the U. S. Department of Agriculture at Beltsville, Md., show.

When the wool is clipped or sheared every 10 weeks, only about 35% is top-quality wool; when the wool is harvested during molting season, about 55% is of No. 1 grade, Dr. Thora Plitt Hardy and Ethel H. Dolnick of the Bureau of Animal Industry found. When the wool is plucked, however, the percentage of top-grade wool is the highest of all.

The wool, found to grow irregularly, averages about .027 inch per day.

Irrespective of these findings, however, breeders may still prefer to clip or shear Angora rabbits so as to save time in harvesting the wool. Or they may still harvest it at 10-week intervals rather than trouble to examine the rabbits periodically to discover the exact time of molt.

Science News Letter, September 10, 1949

BIOCHEMISTRY

Work on Isolating Fatty Chemical Present in Cancer

► **FIRST** steps toward isolating in pure form a fatty chemical believed involved in cancer development and possibly indicating a germ or virus cause of cancer have been taken by Drs. N. Waterman and L. C. Ebeling at the Netherland Cancer Institute at Amsterdam.

Reporting their progress in the journal, *SCIENCE* (Sept. 2), they state that the chemical is an antigen discovered by other scientists some years ago. The antigen was previously reported able to call up in rabbits' bodies antibodies specific against it, acting in this respect like a germ or virus.

The Amsterdam scientists report their work in the hope that it may help others to determine the chemical nature of the fatty substance. If this is done, they state that they believe "an important piece of work will have been performed."

Science News Letter, September 10, 1949

CHEMISTRY

Permanent Flame-Proofing Doesn't Affect Fabric

► **COTTON** and rayon fabrics which won't burst into flames when lighted, yet look the same and feel the same, should be available within the next three months.

No matter how many times these materials are washed at home or cleaned, they can now be made to stay fireproof when treated with a new chemical announced by the Dupont Company.

The exact chemical composition of the compound is being kept a secret because patents have not yet been issued, but it is known that the chemical is a solution of titanium and antimony salts.

Titanium dioxide and titanium hydroxide, and antimony oxide and antimony oxychloride are compounds which are known to produce a flame-proofing effect.

It is claimed that the compound reacts chemically with the molecule of cellulose in rayon or cotton, but does not change the size of the fiber. Nor does it make the fabric stiff or hard.

Expected to be particularly good for curtains and bedspreads, dangerous fire hazards in the home, the new discovery is trade-named "Erifon."

Science News Letter, September 10, 1949

PSYCHOLOGY

Brain Waves Found Linked To Voluntary Movements

► **A LINK** has been found between the alpha rhythm brain waves and voluntary muscular movements in experiments conducted at the Neuropsychiatric Research Center, Whitchurch Hospital, Cardiff, and reported in the scientific journal, *NATURE* (Aug. 27).

The alpha rhythms are electric signals broadcast by the brain cells themselves while the body is at rest. The rhythm is ordinarily interrupted by use of the eyes in vision.

Simultaneous recordings were made of the alpha rhythm and of the opening of the eye in response to an auditory signal. It was found that the eye tends to open at the time of the peak of the alpha rhythm which occurs about every tenth of a second.

Similar results were obtained for other voluntary movements.

These results indicate that voluntary muscular movements are influenced by the electrical rhythms of the brain, is the conclusion of the investigators, Drs. G. O. Kibbler, J. L. Boreham and D. Richter.

Science News Letter, September 10, 1949

PHYSIOLOGY

Height Children Will Grow To Is Predicted

► **HOW** tall a growing child will be when he is grown up is now being predicted to within a quarter of an inch by scientists at Stanford University.

The predictions, useful in treating abnormal growth and for reassuring parents and youngsters, are based on the relation between human growth patterns and the development, or maturation, of the skeleton.

Sex, age in years and present height are considered in relation to the maturation of the skeleton. When this last is within one year of the age in years, the height prediction is given by tables developed by Dr. Nancy Bayley of the university's school of medicine.

She and Dr. Leona M. Bayer of the school of medicine report eight cases in which the adult heights came out to within one-quarter of an inch of the heights predicted while the patients were children.

The doctors emphasize in their report to the *Stanford Medical Bulletin* that the predictions are only a statement of potential not a promise. When growth or maturation or both are disturbed, the potential may never be realized.

The height predictions are useful in cases of retarded or accelerated growth for telling whether treatment by diet, thyroid extract and male or female hormones is being effective.

Science News Letter, September 10, 1949

CHEMISTRY

'Soapless Soaps' Do Many Jobs

Advantages of synthetic detergents over soap are that they save time and energy in cleaning and are effective cleaners in all kinds of water.

By ANN E. EWING

► "SOAPLESS soaps," the cleaning agents which often look like soap, act like soap, but aren't really soap at all, are making household chores easier and less time consuming:

Rings no longer appear on the bathtub and washbowl.

Dishes and glasses are rinsed dry and sparkling clean.

Woolens are washed in one-fifth the time formerly required, in cool water with no matting.

Rugs, upholstery and woodwork are quickly and easily shampooed.

Saving time and elbow grease, the soapless soaps are also known as synthetic detergents. Biggest advantage of these competitors to soap is that they clean effectively in all kinds of water—hot or cold, hard or soft, fresh or sea.

Soap, somewhat similar to that we know today, is known to have first been made by the Romans from tallow and beech ashes. Until about 30 years ago it was undisputed champion for a cleaner world.

Drawbacks of Soap

But there are many disadvantages to using soap: It is practically insoluble in cold water. It is decomposed in acid solutions. It forms a soft, gummy residue by combining with the lime or magnesium salts found in hard water.

Many of these disadvantages are not too objectionable in the home. In industry, however, there are certain operations which are preferably carried out in acid solution, in the presence of metallic salts, or in cold water. These special problems spurred the search for substitutes, synthetic detergents.

The word detergent is not new—it's just one which for a long time went unused. Actually, a detergent is any agent which assists in cleaning. Soap was the most familiar example until the shortage of fats during the war gave the synthetic detergents their big chance.

Soaps and synthetic detergents are cleansing agents because they have the ability to "wet" a surface, to remove foreign material from that surface and to keep the removed material from resettling on the surface.

Dirt or soil is the most usual foreign material found in the home. It is a combination of substances which are soluble in water, and hence offer no problem, and substances which are insoluble in water, mostly particles which are more or less

oily. Removing these particles from a surface, then, is the cleaning problem.

In order for a soap or synthetic detergent solution to remove these oily particles, it must first wet them. Water alone will not do the trick, because of its high surface tension. Floating a needle on water, or examining the shape of a drop of water on a polished surface demonstrates the fact that the surface of water acts like an extremely thin elastic covering.

"Wetter Water"

Certain materials will reduce the surface tension of water. These are known as surface active agents, and both soap and synthetic detergents are examples. Their ability to make water "wetter" has been startlingly demonstrated by the duck which sinks in water to which a detergent has been added. The thin coating of oil which traps air beneath the feathers to keep the duck afloat is wetted and the duck sinks in water.

Getting something clean depends not only on getting it wet, but also on removing the particles from the surface, known as

emulsifying. An emulsion is a fine suspension of one liquid in another, such as the butter fat in fresh milk. Dirty dishwater is also an emulsion—of fine dirt and oil particles in sudsy water.

The third requirement for cleaning, keeping the removed particles in suspension, is known as dispersion. These three properties, wetting, emulsifying and dispersing, are dependent upon surface activity.

The molecules of the surface active agents, soap and synthetic detergents, can be thought of as similar to minute tadpoles. Odd little tadpoles, to be sure, with a tail which hates water and a head which loves water!

When a detergent, either soap or synthetic, dissolves in water the molecules at the surface have their heads, water-loving, pointed toward the water. This leaves the tails pointing away from it, where they are in an excellent position to attach themselves to oily dirt.

Water-Dirt Link

Thus the detergent molecules are the link between dirt and the water which is used to rinse it away. They allow a thin wedge of water to come between the dirt and its adhering surface, preventing them from sticking to each other.

By varying the materials from which the



ADVANTAGE OF SYNTHETIC DETERGENTS—Soapless soaps in the left beaker give plenty of suds, even in hard water, while soap forms gummy curds in the right beaker.



SUDSY BATH—Children play with happy smiles in billowy suds when synthetic detergent is added to their bath water.

synthetic detergents are made, they can be tailored to do a specific job. They are used in toothpastes because they taste better than soap; for bubble baths because some types will foam in any kind of water; in automatic laundries because other types give maximum cleanliness with a minimum of suds; in mouth washes because still other types have antiseptic properties; and for food preparations because yet another variety is tasteless and odorless.

Street cleaners are finding the new products helpful for their jobs. Grease and oil which remains untouched by ordinary water is out of harm's way when as little as five pounds of synthetic detergent is added to the water tank.

Addition to the synthetic detergents of certain materials, known as builders, makes it possible for the product to compete on a price basis with soap. A builder is a substance which has little cleaning action itself, but which improves the cleansing action of the detergent. Most of the synthetic detergents available today in stores contain these builders.

The dry cleaning industry uses synthetic detergents in solvents and in mixtures for spotting. In painting, surface active agents help to produce a better bond between the coating and the surface.

Synthetic detergents can be used in smaller quantities than soap. If a certain amount will do the job, twice that amount will NOT do it twice as well. Doubling the effective quantity may actually decrease the washing efficiency.

Before the war, soapless soaps represented only about one percent of American washing materials. Today, they represent 15%, an even more significant gain than these figures would indicate because the use of

all types of cleaning compounds has increased greatly in the last ten years.

The fats from which soaps and some synthetic detergents are made are an essential part of our diet. In many parts of the world there is a shortage of fats so serious as to be a famine. The increased use of synthetic detergents from petroleum releases some of the fats for use as food

which would otherwise be used to make soap.

Samples of these soapless soaps, with experiments you can do yourself, are available from Science Service. Write Science Service, 1719 N St., N.W., Washington 6, D. C., for one of these kits, enclosing only 50 cents.

Science News Letter, September 10, 1949

MEDICINE

A-Bomb Can Speed Cancer

➤ A SHORTER life and earlier appearance of cancer are likely to be the fate of atom bomb survivors, Dr. Egon Lorenz of the U. S. National Cancer Institute declared at the Gordon Research Cancer Conference held in New London, N. H., sponsored by the American Association for the Advancement of Science.

He referred to "extensive animal research at the National Cancer Institute and elsewhere" as basis for his statement.

Dr. Lorenz disagrees with "people in responsible positions" who have recently been quoted as saying that the hazards of an atomic bomb explosion are comparable to other hazards of war and therefore there is no need to be alarmed over them.

"There is a vast difference as far as effects later in life are concerned," he stated. "Usually the survivors of an explosion by ordinary bombs or incendiaries may, in the vast majority, not expect any special ill-effects later in life. True, some may be crippled by loss of limb but they will adjust and they will be able to live their full life expectancy.

"In other words, the body will forget the injury received and the individual will live on as though the injury had never happened. This, unfortunately, is not true in an atomic bomb explosion in which the body is exposed to penetrating radiation. The body will remember the injury received."

A definite correlation between total dose of radiation and life span was shown in experiments in which the whole bodies of animals were exposed to radiation, as they would be in case of an atomic bomb explosion, for a short time. The time of exposure was a matter of minutes. No experiments were done with exposure time comparable to that of an atomic bomb which is of the order of a millionth of a second, Dr. Lorenz explained.

"The greater the exposure at a given age, the more the life span is shortened," Dr. Lorenz reported.

"This, in severe cases, may mean a loss of many years of life. Furthermore, in the species of animals used, cancer occurred at an earlier age than in non-irradiated control animals. Again, like the shortening of life span, this shifting of the cancer age to a younger age is also dependent on the amount of radiation received, which in

some animals is quite small—so small, in fact, that probably very little immediate effect is noticed."

Science News Letter, September 10, 1949

PSYCHOLOGY

Prejudiced People Have Distorted Memory of Events

➤ CHILDREN who are highly prejudiced against foreigners or minority groups have a biased or distorted memory of things that happen to them and of stories read to them, the American Psychological Association in Denver Colo., learned from a report by Dr. Else Frenkel-Brunswik, of the University of California.

After listening to a story dealing with school children's attitudes toward newcomers and stressing aggressiveness versus friendliness and protectiveness, the prejudiced children remembered the aggressive characters in the story; the unprejudiced children recalled the friendly characters.

A fight was, in fact, the only incident remembered from the story by 42% of the prejudiced children. Only 8% of the unprejudiced children were so exclusively impressed by the fight.

The prejudiced are inclined to lose sight of the overall picture of what the story was about and remember only isolated phrases or details. Once they have formed an idea of the story, they tend to ignore any part of it that does not fit in with the fixed idea.

Science News Letter, September 10, 1949

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WILDLIFE

Saving Rare Animals

➤ TEN animals will soon be dead as the dodo unless man protects them, wildlife experts say.

Among these vanishing "living textbooks of scientific knowledge," the largest is a five-ton rhinoceros that lives in Java, and the strangest is a ten-inch rabbit-like creature from Australia called the pig-footed bandicoot.

The rhino, a one-horned type, was nearly wiped out during the Japanese occupation of Java. All that is saving the few survivors from immediate extinction is the natives' dread of the tigers that share the rhino's Javanese jungle.

The bandicoot's nemesis is not Japs but sheep. Sheep, rabbits, and bandicoots all eat the same thing, and the bandicoot is finishing a poor third. To make matters worse, the hungry bandicoot has himself become an item on the menu of dogs imported into Australia. Ironically, one of the bandicoot's native enemies, the Tasmanian wolf, is similarly being starved out by roaming dogs and cats which beat it to its food.

Two waning fur-bearers are the royal chinchilla of Peru and the wolverine. Although swift and timorous, the chinchilla has not succeeded in eluding the law-breakers. Today only a remnant is believed to exist high in the inaccessible rocks of the Peruvian Andes. The ferocious wolverine, which was once so important a source of fur that Michigan became known as the Wolverine State, is now abundant only in Alaska.

The American Buffalo's continental cousin, the European wisent is going. So is the once-numerous Asiatic lion of which only about 200 survive. Some 500 giant sable antelope remain in Africa and of the brow-antlered deer there are "only a few hundred left in Burma." South African mountain zebra are down to a handful, mostly in zoos.

The ten vanishing animals were listed by Dr. Antoon de Vos, formerly of the Netherlands East Indies, now with the

Canadian Department of Lands and Forests. He is one of several hundred scientists invited to UNESCO's International Technical Conference on the Protection of Nature, held at Lake Success, which has just ended. The one-week conference has been considering such other problems as the effects of DDT and other insecticides on the balance of nature, and the consequences of introducing an animal into a new environment, in addition to the problem of vanishing species. Conservationists here are hopeful that by setting up wildlife preserves and by tightening and enforcing game laws, they will rescue these animals from the dodo's fate.

Science News Letter, September 10, 1949

ARCHAEOLOGY

Controversy Over Whether Tawide Made It

➤ "MADE in America" may some day start a scientific controversy, judging from this story of Danish scientists.

In 1947, a Danish peat digger uncovered a plain wooden box which has settled a dispute of long standing among students and experts of the Old Norse language.

The box with a sliding lid may have been used for keeping a razor, sewing needles, or perhaps bait for a fisherman. Archaeologists estimate its age to be at least 1,400 years.

On the side is carved "Hagiradar—Tawide." Hagiradar is a man's name. It means "one adept at giving advice."

"Tawide" appears here for the second time. It came to light the first time on the Little Gold Horn at Mogletonder, South Slesvig. This horn is engraved with pictures and the word "Tawido."

One school held that "Tawido," first person singular, was the name of the artist who made the engraving. Others maintained it was the name of the man who made the horn.

Because the small box uncovered at Stenmagle with the name contains no ornamental work, it is now conceded that "Tawido" means maker. Translated into modern English the inscription should read, "Made by Hagiradar."

Science News Letter, September 10, 1949

MEDICINE

Asthma Relief Follows Jaundice Infection

➤ DRAMATIC relief from asthma in three chronic sufferers followed jaundice infection, Dr. Nathan Gorin of Harvard Medical School and the Children's Medical Center in Boston reported.

The mechanism at work is unknown, al-

though fever and surgery have also been known to bring temporary relief from asthma, Dr. Gorin stated in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Sept. 3).

One patient had been a chronic asthma sufferer for 24 years, depending on drugs for relief. With the first signs of nausea and abdominal distress, which was later diagnosed as jaundice, the patient's asthma was milder. Relief lasted for 10 weeks.

Another patient, who is thought to have developed jaundice from a blood transfusion, was immediately free from the symptoms of asthma and hayfever. Eventually he was cured of the jaundice but the allergies did not return.

The third patient got little relief from her asthma in the medications she was taking until she suddenly developed jaundice stemming from a cancer of the liver. Her asthma then became milder than it had ever been since it first developed.

Dr. Gorin feels that these cases, and others in which jaundice has relieved arthritis, point to certain reparative powers within the person that are set free when changes occur in the liver. Animal experiments and clinical studies are being made to discover the mechanism behind this.

Science News Letter, September 10, 1949

MEDICINE

Convulsions Brought on By Some Allergy Drugs

➤ TWO anti-allergy drugs have shown that they can bring on convulsions in certain epileptic patients in tests reported by two Philadelphia physicians.

The drugs, benadryl and pyribenzamine, are known as antihistaminic because they check the action of histamine, a poison released by the tissues in allergic reactions.

The effect of the drugs on the patients was gaged by the electro-encephalogram, which measures the tiny electric current generated by the brain.

Both of the drugs increased the number of attacks in patients with focal lesions of the cerebral cortex, which is usually an uncontrollable jerking of one side of the body, Drs. John A. Churchill and George D. Gammon of the University of Pennsylvania stated in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Sept. 3).

Benadryl showed some promise as a remedy for patients with petit mal, a mild form of epilepsy, in that there was a slight improvement in the electrical wave pattern of these patients. Pyribenzamine had the opposite effect on petit mal patients. It excited a greater abnormal activity of the electrical impulses in the brain, the physicians stated.

Drs. Churchill and Gammon urge that antihistaminic drugs be used with care in the treatment of patients who suffer with convulsive disorders since the drugs have been proven to bring on attacks.

Science News Letter, September 10, 1949

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SYNCHRONIZATION - STOP					FUEL GAS LOW				
2	ON	ON	OFF	ON	ON				
FUSES					ABS				
3	DISCH.	DIST.	H-L VOLT	REG. FAIL	24V 130V	48V			
POWER CONTROL PANEL FAILURE									
4	201-202W	203-204W	205-206W	207-208W	201-202E	203-204E			
ALT. CONT. BAY - NO VOLT. OUT.					NO VOLT. - TRAN				
5	201	203	205	207	201	203			
	202	204	206	208	202	204			
RECTIFIER - INVERTER FAIL					RECTIFIER - INVERTER FAIL				
6	RECT FAIL 24/130V	48 V H-L VOLT	NO. 1			NO. 2		NO. 3	
64 KC PILOT ALARM AT NON-SW. MAIN									
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2064 KC PILOT ALARM AT NON-SW. MAIN					3096 (SP. LINE) PILOT AT SW. MAIN				
8	201	202	203	204	205	206	207	208	201
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3096 KC PILOT ALARM AT NON-SW. MAIN					SP. LINE FAIL AT SW. MAIN				
9	201	202	203	204	205	206	207	208	201
									203

CARRYING hundreds of telephone calls, coaxial cable runs through many lonely miles. Far from towns and people, master amplifying stations stand guard with a new automatic alarm system developed by Bell Telephone Laboratories.

At a city terminal, the man on duty checks by laying a log sheet over a glass window, dialing a master station hundreds of miles away. At once the station gives an account of itself, lighting lamps under the log sheet to report any abnormal operating condition before it becomes an emergency.

But when something happens that threatens serious trouble, the apparatus acts at once—maybe by switching in a spare coaxial—and calls a distant test board by ringing a bell. Sometimes he can take further steps by remote control; if not, he knows exactly how to brief the nearest repair crew.

With this new alarm system, maintenance men need not be stationed at isolated points, just waiting for something to happen. Instead, they live in their home communities. This makes for better work . . . and better telephone service.



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FORESTRY

NATURE RAMBLINGS

by Frank Thone



Foe Into Friend

► UNTIL quite recently, man has regarded the forest as his enemy. He who made a clearing was a benefactor to the community as well as an operator for his own gain; the new field increased the potential food supply, and added the resources of one family to the communal defense against a hostile world of savage beasts, and even more savage men, that lurked behind the leafy frontier. This culture-pattern of making a virtue of getting rid of trees in order to get at the land, is

of recent memory in this country; but it only repeated what happened a few centuries ago in Europe.

How completely this attitude toward the forest has been reversed is almost dramatically demonstrated in the recently issued U. S. Department of Agriculture Yearbook for 1949, which is titled, simply: TREES. The forest now is our friend—and suddenly discovered to be an old and rather ailing friend, needing sympathetic assistance of every kind to aid in recovery and restoration of helpful strength. In the scores of articles that fill its nearly 1,000 pages, the good we derive from the forest is rehearsed from every angle, the harm we do to it, wittingly and unwittingly, is set forth just as painstakingly, and possible cures or preventive for its many ills are described, each by a scientific specialist.

About the only prescription there was for the forest a century ago was the rough surgery of ax and saw and the harsh cautery of reckless fire. But now we see planting dibbles and spades, pruning knives and shears, insecticides and fungicides, all solicitously applied in the infancy and youth of the forest, so that in its maturity the ax and saw (more judiciously wielded now) may have a measured harvest.

We see, too, the manifold kindnesses that man may win from this ancient friend, once looked upon as a foe. Our grandsires saw only logs for cabins, later boards and squared timbers for more pretentious houses, plus, possibly, some potash for the soapmaking and a few casual nuts and wild fruits. We still get these (though not in such abundance) but we have added the endless acres of newsprint we read every day, chemicals ranging from synthetic lacquer to synthetic liquor, protection for our cities' water supplies, pleasant places for camping, hunting and fishing, and other items quite literally too numerous to mention. No wonder we feel as if we had almost murdered Santa Claus!

Science News Letter, September 10, 1949

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PSYCHOLOGY

Introduction to Person Affects First Impression

► YOUR first impression of a person you meet is governed a good deal by what you are told about him by the person introducing him.

This was shown by an experiment in which a substitute instructor was presented to three classes of college men who were asked to rate the instructor's personality.

Half the students were told that the instructor is "rather cold." The others were told that he is "very warm."

The students who were tipped off that the substitute was a warm person later rated him as more considerate of others, less formal, more sociable, more popular, more humorous, more humane and better matured, than did those who expected him to be cold.

The students who had the expectation that the substitute would be warm also participated more in class discussion than did the other students and so had more opportunity to get acquainted with him.

The experiment was reported to the American Psychological Association in Denver, Colo., by Dr. Harold H. Kelley, of the University of Michigan.

Science News Letter, September 10, 1949

AGRICULTURE

Herring Industry Subject Of International Meeting

► THE all-important herring industry, which supplies the world with great quantities of fish food each year, was the subject of an international conference at The Hague in the Netherlands, attended by representatives of the major fishing countries, including the United States.

The meeting was called by the Food and Agriculture Organization of the United Nations, with headquarters in Washington, D. C. Invitations were sent to practically all countries of Western Europe, Greece, Poland, Yugoslavia and Canada, as well as to the United States.

The major subject of discussion was the economic problems related to the production and distribution of herring and allied species. It was expected that the meeting will iron out difficulties in individual nations which must be solved through international action, and would agree on a course of action for the solution of these problems.

The herring problem is of particular interest in America, coming into prominence in the past few decades. Herring fisheries in northwestern Europe are very old and have played an important part in history. In more recent years, herring species similar to those of Europe have become of importance to Canada, the United States and Japan. In the late thirties, these three countries together accounted for more than half of the world's total catch of herring and allied species.

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Words in Science— HEAT STROKE

► HEAT STROKE and heat exhaustion are two summer ailments which are not the same and require opposite treatments.

Symptoms of heat stroke are: Headache; red face; hot, dry skin with no sweating; strong and rapid pulse; very high temperature; usually unconsciousness.

Symptoms of heat exhaustion: Pale face; moist, cool skin with profuse sweating; weak pulse; low temperature; sometimes nausea, vomiting and giddiness.

What is commonly called "sunstroke" may be either of these two conditions.

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Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N. St., N. W. Washington 6, D. C. Ask for free publications direct from issuing organizations.

THE DIAGNOSIS OF PANCREATIC DISEASE—Louis Bauman—*Lippincott*, 74 p., illus., \$5.00. A monograph discussing the pancreatic function tests and their application in the diagnosis of pancreatic disease.

THE EPITOME OF ANDREAS VESALIUS—L. R. Lind, Translator—*Macmillan*, 103 p., illus., \$7.50. The first English translation from the Latin of this famous physician's work.

FREEZE-DRYING: Drying by Sublimation—Earl W. Florsdorf—*Reinhold*, 280 p., illus., \$5.00. A technical book on the principles and practical applications.

THE FUNDAMENTALS OF ELECTROMAGNETISM—E. G. Cullwick—*Cambridge University Press*, 2nd ed., 327 p., illus., \$4.00. For the student of electrical engineering.

FUNDAMENTAL CONSIDERATIONS IN ANESTHESIA—Charles L. Burstein—*Macmillan*, 153 p., illus., \$4.00. A monograph. Attempting to answer questions concerning complications that may arise during surgical intervention.

ISOTOPES—Isotopes Division—*United States Atomic Energy Commission*, 45 p., illus., paper, free upon request to publisher, Oak Ridge, Tenn. A catalogue for those interested in the procurement or use of radioisotopes.

MATTER, MIND AND MEANING—Whateley Carington—*Yale University Press*, 257 p., \$3.75. The author tells how he believes the researches in psychical phenomena can be incorporated into a philosophy based on the well-explored and well-established sciences.

NORMALCY TESTS OF PRECIPITATION AND FREQUENCY STUDIES OF RUNOFF ON SMALL WATERSHEDS—W. D. Potter—*Gov't Printing Office*, 24 p., illus., paper, 40 cents. Results

covering 10 years of investigations.

THE RAT IN LABORATORY INVESTIGATION—Edmond J. Farris and John Q. Griffith—*Lippincott*, 2nd ed., 542 p., illus., \$15.00. Contributions from twenty-nine authorities.

SOCIOLOGY—Emory S. Bogardus—*Macmillan*, 3rd ed., 598 p., \$4.50. A beginning college text.

THE SPECTRUM OF NOVA PERSEI 1901—Dean B. McLaughlin—*University of Michigan Observatory*, Vol. IX, No. 3, 71 p., illus., paper, free of charge upon request to publisher, Ann Arbor, Michigan. The first nova to have a detailed and fairly continuous spectroscopic record is here analyzed at considerable length.

SUBJECT HEADINGS FOR AERONAUTICAL ENGINEERING LIBRARIES—Committee of the Engineering-Aeronautics Section—*Special Libraries Association*, 245 p., illus., paper, \$4.00.

TOPOGRAPHICAL ANATOMY OF THE DOG—O. Charnock Bradley and Tom Grahame—*Oliver and Boyd* (Macmillan)—5th ed., 319 p., illus., \$7.00. Revised and brought up to date. A textbook intended as a guide for dissection.

TREES: The Yearbook of Agriculture—United States Department of Agriculture—*Gov't Printing Office*, 944 p., illus., \$2.00. A compilation of articles by leading authorities. Beautifully illustrated. Covers shade trees for the home, tree farming, forest care, and the identification of woods.

THE UNITARY PRINCIPLE IN PHYSICS AND BIOLOGY—Lancelot Law Whyte—*Holt*, 162 p., \$3.50. A philosophical work advancing the author's conviction of the unity of nature.

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degrees Fahrenheit to the "dripping heat of the tropics" has been built for the research being conducted by Dr. William J. Dieckmann, chief-of-staff and professor of obstetrics and gynecology.

The onset of the convulsions and coma of eclampsia in pregnant women is definitely related to hot, humid climate, Dr. Dieckmann found from a statistical study.

Eclampsia, most frequent during the last two and three months of pregnancy and especially during labor, is said to be one of the two greatest threats to safe childbirth and is fatal in 13 out of every 100 cases that develop in expectant mothers.

Sudden changes in weather, although not the cause of the condition, may, Dr. Dieckmann thinks, bring on in susceptible patients changes in water balance, circulation and acid base equilibrium which intensify the high blood pressure, dropsy and kidney disorder until convulsions and coma occur.

The climate room will be used to find out whether the convulsions and coma can be warded off by controlling the weather and also what conditions of temperature and humidity are most helpful to the patient.

Refrigeration for the room, unlike air conditioning, uses a brine solution for securing proper temperature and humidity.

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BIOCHEMISTRY

Efficiency of Green Leaf

► THE green leaf, the sun-stoked factory which creates food for man and other animals, has an efficiency rating of at least 65% and maybe as much as 85%.

"Conclusive" findings for this rating are reported by Drs. Dean Burk, Sterling Hendricks, Mitchell Korzenovsky, Victor Schocken and Nobelist Otto Warburg in the journal, *SCIENCE* (Sept. 3).

The research in which the green plant's efficiency was rated was done at the U. S. National Cancer Institute in Washington, the U. S. Plant Industry Station, Beltsville, Md., and at the Marine Biological Laboratory, Woods Hole, Mass.

Plants, using energy from the sun, combine carbon dioxide from the air and water from the earth to form starch and sugar. In the process, the oxygen is broken out of the water and set free in the atmosphere.

Using new experimental techniques, the scientists have shown, as Dr. Warburg demonstrated by more complicated tech-

niques in 1933, that energy in the form of photons of light can be made to liberate oxygen atoms in the plant's photosynthetic process with nearly perfect efficiency. In other words, the plant does this with full utilization of the energy from the sun and relatively little loss of energy in the form of heat.

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MEDICINE

"Climate Room" Will Help Save Expectant Mothers

► SAVING expectant mothers from eclamptic convulsions and death by scientific weather control is the hope of research now going on at the Chicago Lying-in Hospital and Dispensary of the University of Chicago.

A "climate room" where the weather may be varied from crisp coolness at 50

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N. St., Washington 6, D. C. and ask for Gadget Bulletin 482. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

❁ **FIRE-PROTECTION** paint, of ordinary thickness as applied, puffs up under the intense heat of a blow-torch to a spongy mass about an inch thick that gives full protection to the wood under it. Designed for indoor use, particularly for basement ceilings, its varnish-like surface can be covered with conventional paint to provide color.

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❁ **POCKET MICROSCOPE**, about fountainpen size, has a lens system built into an aluminum barrel and a fine-focusing button on the side which can be adjusted by the forefinger of the hand holding the instrument. In use, the end of the tube rests on the object to be examined.

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❁ **IMPROVED COOLER** for airplanes on the ground, for use at air bases in the tropics, is 65% lighter than an industrial refrigerating unit of the same capacity, utilizes air as the working medium, and is operated by a 100-horsepower air-cooled gasoline engine. It can thus be used where water is unavailable.

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❁ **ELECTRIC VACUUM** cleaner, shown in the picture, separates the dust it collects from the air it uses by means of a transparent plastic base that holds water. All air



taken in bubbles through the water and is automatically filtered, the dust settling to the bottom.

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❁ **ELECTRIC FLATIRON**, recently patented, has two revolving disks in the ironing surface which rotate at different speeds and in opposite directions. The faster and smaller disk is near the point-end of the

iron and smooths out wrinkles to facilitate free and easy gliding over the textile surface.

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❁ **ALUMINUM OXIDE** mortar and pestle, for use in pulverizing samples of very hard substances in laboratories, may be used to grind beryl, Carborundum, and similar materials with ratings below that of tungsten carbide. It is not magnetic, and will not flake to contaminate the contents.

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❁ **ELECTRONIC SCALE** for weighing livestock at public markets measures the weight of the animals accurately to within five pounds up to 32,000 pounds through electrical impulses, and records pressures electrically. When certain buttons are pressed, it prints the weight, number and type of animals.

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❁ **HEARING AID** attachment, to fix over the microphone worn under the clothes to eliminate noises that result from clothing movement, is called a clothing noise insulator and consists of a plastic ring backed with cork; it is easily attached by an adhesive applied to the cork.

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Do You Know?

"Corn" is an Anglo-Saxon word which means grain of any kind.

Nylon cord tires for airplanes provide decreased danger from blow-outs during landings.

Scorpions, several species of which occur in southern and western states, have long segmented tails which they curl over their backs when alarmed with the stinger at the tip ready for attack.

Cloves have been used for over 4,000 years to sweeten the breath.

Many types of clay will be satisfactory as a source of aluminum with new methods of extraction under development.

A landing strip has been constructed on the grounds of the Kansas State Fair because so many of the visitors are now "flying farmers."

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